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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,988	08/04/2003	Seong Ho Kang	YHK-0115	2974

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EXAMINER	
BODDIE, WILLIAM	
ART UNIT	**PAPER NUMBER**
2674	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,988	KANG ET AL.	
	Examiner	Art Unit	
	William Boddie	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 8-23-04
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because the word 'temperature' is misspelled "temperatare" in figures 7, 9, 10 and 11. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD AND APPARATUS FOR TEMPERATURE DEPENDENT DRIVING OF A PLASMA DISPLAY PANEL.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Awamoto et al. (US 6,720,940).

With respect to claim 1, Awamoto discloses, a method of driving a plasma display panel having one frame divided into a plurality of sub-fields for its driving, comprising the steps of (fig. 6):

applying a first driving waveform to said sub-fields at a temperature more than a low temperature (T1'+Ti1 ... T8'+Ti8 in fig. 6); and

applying a second driving waveform different from the first driving waveform to said sub-fields at the low temperature (T1' ... T2' in fig. 6; also note col. 8, lines 16-24).

With respect to claim 2, Awamoto discloses, the method as claimed in claim 1 (see above), wherein each of said sub-fields includes an initialization period (TR in fig. 12), which is divided into a set-up interval for forming wall charges at a discharge cell

(Prx in fig. 12) and a set-down interval for erasing a portion of the wall charges formed in the set-up interval (col. 2, lines 25-28).

With respect to claim 7, Awamoto discloses, a method of driving a plasma display panel in which an initialization period included in each sub-field is divided into a set-up interval (Prx in fig .12) and a set-down interval for its driving (col. 2, lines 25-28), comprising the steps of displaying a picture on the panel (this is an inherent outcome of using the plasma display panel); sensing a driving temperature of the panel; and setting a driving waveform to be applied in the set-up interval in correspondence with said driving temperature of the panel (col. 8, lines 16-24).

With respect to claim 8, Awamoto discloses, the method as claimed in claim 7 (see above), wherein a driving waveform supplied when said driving temperature of the panel is a low temperature is set differently from a driving waveform supplied when said driving temperature of the panel is more than the low temperature (note figure 6, in which B and C are different frames caused by a sensed temperature, also note again col. 8, lines 16-24).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-6 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awamoto et al. (US 6,720,940) in view of applicant's admitted prior art (figures 3 and 5, hereinafter referred to as APA).

With respect to claim 3, Awamoto discloses, the method as claimed in claim 2 (see above).

Awamoto does not expressly disclose, wherein each said first and second driving waveforms are set such that the waveforms applied in the set-up interval are different from each other while the waveforms applied in the other interval are identical to each other.

APA discloses conventional driving waveforms (subfield1 in fig. 3, and fig. 5) that are identical to one another except for the different set-up interval.

Therefore it would have been obvious to replace the waveforms of Awamoto with the driving waveforms of APA for the benefit of improved contrast (APA, para. 20) to obtain the invention as specified in claim 3.

With respect to claim 4, Awamoto discloses, the method as claimed in claim 2 (see above).

Awamoto does not expressly disclose, the steps of:

applying a rising ramp waveform to a scan electrode provided at each discharge cell during the set-up interval when said first driving waveform is supplied;

applying a ground voltage to a common sustain electrode provided, in parallel with the scan electrode, at each discharge cell in the first half of the set-up interval; and

floating the sustain electrode in the second half of the set-up interval.

APA discloses such a waveform in figure 5, with rising ramp (Ramp-up) and ground voltage and floating (Z set-up period).

Therefore it would have been obvious to replace the waveforms of Awamoto with the driving waveform of APA for the benefit of improved contrast (APA, para. 20) to obtain the invention as specified in claim 4.

With respect to claim 5, Awamoto discloses, the method as claimed in claim 2 (see above).

Awamoto does not expressly disclose, the steps of:

Applying a rising ramp waveform to a scan electrode provided at each discharge cell during the set-up interval when said second driving waveform is supplied and

Applying a ground voltage to a common sustain electrode provided, in parallel with the scan electrode, at each discharge cell.

APA discloses such a waveform in figure 3, with rising ramp (Ramp-up) and ground voltage (Z set-up period).

Therefore it would have been obvious to replace the waveforms of Awamoto with the driving waveform of APA for the benefit of reduction of brightness misfires (APA, para. 33) to obtain the invention as specified in claim 5.

With respect to claim 6, Awamoto discloses, the method as claimed in claim 2 (see above).

While Awamoto does not expressly disclose wherein said low temperature is 20° C. to –50° C, this further limitation is merely a design choice and would have been an

obvious temperature range choice as this is approximately the range that a brightness misfire is likely to occur at when using conventional drive waveforms (APA, para. 33).

Therefore it would have been obvious to limit the low temperature to 20° C. to –50° C to obtain the invention as specified in claim 6.

With respect to claim 9, Awamoto discloses, the method as claimed in claim 8 (see above), and altering the driving waveform in response to panel temperature.

Awamoto does not expressly disclose the steps of:

applying a rising ramp waveform to a scan electrode provided at each discharge cell during the set-up interval when said driving temperature of the panel is said low temperature; and

applying a ground voltage to a common sustain electrode provided, in parallel with the scan electrode, at each discharge cell.

APA discloses such a waveform in figure 3, with rising ramp (Ramp-up) and ground voltage (Z set-up period).

Therefore it would have been obvious to replace the waveforms of Awamoto with the driving waveform of APA for the benefit of reduction of brightness misfires (APA, para. 33) to obtain the invention as specified in claim 9.

With respect to clam 10, Awamoto discloses, the method as claimed in claim 8 (see above), and altering the driving waveform in response to panel temperature.

Awamoto does not expressly disclose the steps of:

applying a rising ramp waveform to a scan electrode provided at each discharge cell during the set-up interval when said driving temperature of the panel is said low temperature; and

applying a ground voltage to a common sustain electrode provided, in parallel with the scan electrode, at each discharge cell; and

floating the sustain electrode in the second half of the set-up interval.

APA discloses such a waveform in figure 5, with rising ramp (Ramp-up) and ground voltage and floating (Z set-up period).

Therefore it would have been obvious to replace the waveforms of Awamoto with the driving waveform of APA for the benefit of improved contrast (APA, para. 20) to obtain the invention as specified in claim 10.

7. Claims 11, 12 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awamoto et al. (US 6,720,940) in view of Nagai (US 6,011,355).

With respect to claim 11, Awamoto discloses, a driving apparatus for a plasma display panel in which an initialization period included in each sub-field is divided into a set-up interval (Prx in fig. 12) and a set-down interval (remainder of TR in fig. 12) for its driving, comprising:

A temperature sensor for sensing a driving temperature of the panel (75 in fig. 3);

A timing controller for controlling a turning-on and a turning-off of the switching device in correspondence with a temperature inputted from the temperature sensor (71,72 and 61 in fig. 3).

Awamoto does not expressly disclose, a switching device provided between a plurality of common sustain electrodes provided at the panel and a ground voltage source;

Nagai discloses, a switching device (28 in fig. 1) provided between a plurality of common sustain electrodes (X in fig. 1) provided at the panel and a ground voltage source.

Nagai and Awamoto are analogous art because they are from the same field of endeavor namely, plasma displays driving methods.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the switching device, disclosed by Nagai, in the sustain driving circuitry of Awamoto.

The motivation for doing so would have been to hold the sustain electrodes at a ground level (Nagai, col. 12, lines 19-20) and thus reduce the chance of noise affecting the electrodes.

Therefore it would have been obvious to combine Nagai and Awamoto for the benefit of holding the electrodes at ground to obtain the invention as specified in claim 11.

With respect to claim 12, Awamoto and Nagai disclose, the driving apparatus as claimed in claim 11 (see above).

Awamoto further discloses, wherein said timing controller differently controls said turning-on and said turning-off of the switching device when a driving temperature inputted from the temperature sensor is a low temperature and when a driving

temperature inputted from the temperature sensor is a temperature more than the low temperature (as disclosed in claim 11, the inclusion of Nagai's switching device in the sustain driver would have been obvious. Awamoto discloses, the sustain driver output being controlled by the timing controller (71, 72 and 61 in fig. 3))

With respect to claim 15, Awamoto and Nagai disclose, the driving apparatus as claimed in claim 11 (see above).

Awamoto further discloses:

a sustain driver for driving the common sustain electrode (66 in fig. 3);

a scan driver for driving a plurality of scan electrodes provided in parallel with the common sustain electrode (67 in fig. 3); and

a data driver for driving a plurality of address electrode provided in a direction crossing the common sustain electrode (68 in fig. 3),

wherein said timing controller controls the sustain drive and the scan driver and the data driver (note fig. 3 and col. 6, lines 37-41).

With respect to claims 16 and 17, the only difference from claims 11 and 12 is the replacement of a timing controller with a switch controller. As applicant's disclosure does not offer any additional specialized functionality for the switch controller, and as the timing controller includes the functionality of a switch controller (controlling the operation of the switching device), claims 16 and 17 are rejected on the same merits as those shown above in claims 11 and 12.

8. Claims 13-14 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Awamoto et al. (US 6,720,940) in view of Nagai (US 6,011,355) and

further in view of applicant's admitted prior art (figures 3 and 5, hereinafter referred to as APA).

With respect to claim 13, Awamoto and Nagai disclose, the driving apparatus as claimed in claim 12 (see above). They also disclose as shown above in claim 12 limitations, using the timing controller of Awamoto to control the switching device of Nagai.

Awamoto and Nagai do not expressly disclose, floating the common sustain electrode when a driving temperature inputted from the temperature sensor is more than said low temperature.

As shown above APA discloses, such a waveform in figure 5, floating common sustain electrode (Z set-up period).

Therefore it would have been obvious to replace the more than low temperature waveform of Awamoto with the driving waveform of APA and using the switching device of Nagai to implement the waveform for the benefit of improved contrast (APA, para. 20) and to hold the electrodes at ground when not driving the panel (Nagai, col. 12, lines 19-20) to obtain the invention as specified in claim 13.

With respect to claim 14, Awamoto and Nagai disclose, the driving apparatus as claimed in claim 12 (see above).

Awamoto and Nagai do not expressly disclose, wherein said timing controller turns on the switching device during the set-up interval when a driving temperature inputted form the temperature sensor is said low temperature.

As shown above, APA disclose, such a waveform in figure 3, with ground voltage (Z set-up period).

Therefore it would have been obvious to replace the low temperature waveform of Awamoto with the driving waveform of APA and using the switching device of Nagai to implement the waveform for the benefit of reduction of brightness misfires (APA, para. 33) and to hold the electrodes at ground when not driving the panel (Nagai, col. 12, lines 19-20) to obtain the invention as specified in claim 14.

With respect to claims 18 and 19, the only difference from claims 13 and 14 is the replacement of a timing controller with a switch controller. As applicant's disclosure does not offer any additional specialized functionality for the switch controller, and as the timing controller includes the functionality of a switch controller (controlling the operation of the switching device), claims 18 and 19 are rejected on the same merits as those shown above in claims 13 and 14.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wlb
10-5-05

REGINA LIANG
PRIMARY EXAMINER